Tree Pest Leaflets Number 10

Nectria Canker of Hardwoods in New England

(*Nectria coccinea* and other species)

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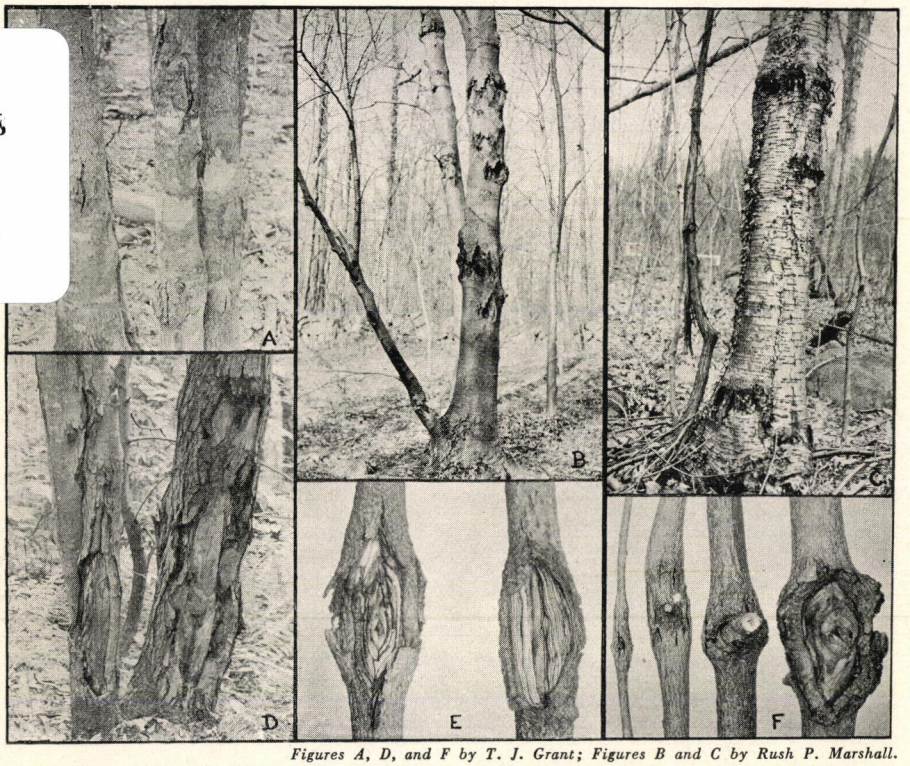

Figures A, D, and F by T. J. Grant; Figures B and C by Rush P. Marshall.

Fig. A. Sugar maples with Nectria cankers nearly healed over, at bulges with cracks along their middle caused by closing callus. This species often outgrows the disease.
Fig. B. Sweet birch with numerous trunk "pit" cankers. This species is often killed by the Nectria.
Fig. C. Yellow birch with several bark-covered cankers. This species is often killed by the Nectria.
Fig. D. Red maple with large Nectria cankers originating in old mechanical wounds.
Fig. E. Nectria cankers showing concentric ridging of wood which often occurs with this disease.
Fig. F. Variations in canker formation on the same species of tree. First three are bark-covered.

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(*Nectria coccinea* and other species)

Distribution: Nectria canker has been known for many years but has been investigated only rather recently. It is widely and generally distributed on ornamental and shade trees and in the hardwood forests of New England.

Hosts: Nectria attacks all hardwood species but varies greatly in intensity, some hardwoods being rarely cankered while others are very susceptible. Susceptibility of a given species varies much in different localities so that rating of species of trees as to frequency of cankers can be stated only as a general rule with more or less marked exceptions. Species which are most apt to be heavily cankered are red maple; yellow, sweet, gray and paper birches; sugar and mountain maples; and red and black oaks. Species which are not commonly cankered in New England are white ash, elm, hickory, basswood, white and scarlet oaks.

Symptoms: The most obvious type of canker is the large open pit with swollen edges. The exposed dead wood in the center usually shows concentric layers where the callus layer has been killed back each year by the fungus. There are all gradations from the open, widely flaring pit (Figures B, E, F4) to completely bark-covered cankers (Figures A, C, F1, 2, 3) which can be detected only by the somewhat depressed appearance caused by cessation of wood growth on the dead area and continued slow growth around the edges. Tiny bark-covered cankers scarcely an inch long may be found on small twigs, seedlings and sprouts (Figure F1). Cankers vary in length up to several feet (Figure D). They are not usually much more than 12 inches wide. Their width largely depends on the size of the twig, branch, or trunk upon which they are located. The canker sometimes is healed over on vigorously growing trees, making a slight bulge, with or without an obscure crevice where the callus folds meet (Figure A). Nectria cankers sometimes kill trees outright but far the greater number cause chronic weakening or crippling leading to premature death or wind breakage.

Cause: Nectria canker is caused by a number of different Nectrias which grow mostly in the inner bark of the tree. Their fruits are much

alike except when seen through a microscope. The fruits are reddish, rounded bodies about the size of a pinhead, crowded more or less thickly together in groups. They are the visible part of the fungus which often may be found on the outer edges of the dead bark and wood of a canker crowded close to the callus or even under it. Sometimes they are on the callus edge itself.

Life History: Thousands of tiny spores (seed bodies) are produced in these round, fruiting bodies and are thrown off into the air. They are so small that the slightest breath of air will carry them away to unknown distances. Such a spore floating on the breeze finally strikes some obstacle and sticks there. If enough moisture is present, it germinates and a tiny "germ-tube" develops. It acts somewhat like the rootlet sent out by a germinating seed, except that it seeks to bury itself in the tissues of a hardwood tree rather than in soil. If the germinating spore happens to lie on the freshly injured surface of bark, its germ tube burrows among the broken cells and soon establishes itself so firmly that drying of the moist surface cannot injure it. It soon is able to extract nutriment from the dead and dying cells of the injured bark and gradually extends into the living tissues beyond, beginning the formation of a canker by killing the adjacent inner bark and the underlying live annual rings of wood. The injuries through which entrance can be made may be due to a great number of causes (axe cuts, pruning wounds, frost cracks, cracks caused by sharp bending of branches by heavy loads of snow or ice, insect bites or tunnels, etc.). The essential thing for infection to occur is a fresh wound extending through the corky bark into the living inner bark.

The entire process of infection, formation of a canker, and formation of fungous fruits on the surface of the canker may take but a few weeks. Some cankers are healed by vigorously growing trees. The Nectria canker sometimes nearly girdles the part it is on and kills the outer end of the twig or branch. In such cases the Nectria itself may die. But many cankers continue to grow slowly for years. Some cankers have been examined which were 35 years old and some undoubtedly are older. Old cankers may produce Nectria fruits for years but many appear to lose the power to fruit. Fruits may continue to form for several years after the death of a cankered tree.

Control: Since the spores are wind-borne, the disease can spread for an unknown distance from a fruiting canker. The disease is present in practically all hardwood stands. Therefore, it is usually inadvisable to go over large areas solely to remove cankered trees. Such removal should go hand in hand with silvicultural work such as thinnings, selection cuttings, etc. Indeed, the removal and utilization of cankered trees should be an integral part of silvicultural practice. Where possible, cankered trees should be removed, the larger parts used for fuel, and cankered branches should be burned. Where this cannot be done, the trees may be felled or girdled, where there are not strong silvicultural reasons for retaining such trees so that the stand will not be opened too severely. In any case, cankered trees should be considered as shorter lived than normal ones and be treated accordingly. Anything which tends to promote the vigor of a stand should help to reduce damage from Nectria.

Ornamental and shade trees which are cankered may be treated by cutting out cankered branches and treating the wounds with shellac, paint, or other wound dressings. Trunk cankers should have all dead wood protected by wound dressings, especially next to the callus edges. Fertilizing trees to increase vigor of growth should help to reduce cankering by Nectria. Attention should be given to the menace by trunk cankers' weakening the tree, thus increasing the liability of breakage by high winds.

REFERENCES

Ashcroft J. M. European canker of black walnut and other trees. West Virginia Agricultural Experiment Station, Bulletin 261: 1-52. 1934.

Spaulding, Perley, T. J. Grant, and T. T. Ayers. Investigations of Nectria diseases in hardwoods of New England. Jour. For. 34 (2): 169-179, 1936.

Welch, D. S. The range and importance of Nectria cankers on hardwoods in the Northeast. Jour. For. 32 (9): 997-1002, 1934.